AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (CURRENTLY AMENDED) A method for measuring a flow rate (v) or a mass flow of a fluid ~~(3)~~, in particular for measuring hot water supply in the private, public or industrial sector, in which the fluid ~~(3)~~ is guided over a sensor element ~~(1)~~, which has a heating means ~~(la)~~ for inducing temperature changes and a sensor means ~~(lb)~~ for determining its temperature, wherein at least from time to time the heating means ~~(la)~~ is operated with a heating power (P) in the form of heating pulses and a flow-dependent threshold value time (t_s) is measured at the sensor means ~~(lb)~~ until a preset temperature threshold value (T_s) is reached, ~~characterised in that~~ <u>wherein</u> during at least some of the heating pulses ~~(7)~~ a non-constant heating power (P) with a substantially sublinear build-up dynamics (P(t)) as a function of time (t) is selected in order to at least partially compensate a nonlinear behaviour of the threshold value time (t_s) as a function of the flow rate (v).

2. (CURRENTLY AMENDED) The method as claimed in claim 1, ~~characterised in that~~ <u>wherein</u> the build-up dynamics (P(t)) as a function of the time (t) and, if required, of the flow rate (v) to be measured is varied itself such that the threshold value time (t_s) is a linear function of the flow rate (v) at least on discrete flow rate values (v_i).

3. (CURRENTLY AMENDED) The method as claimed in any one of the preceding claims, ~~characterised in that~~ <u>wherein</u> the build-up dynamics (P(t)) is selected to be proportional to t^m, wherein m=an exponent dependent on a Reynolds number of the fluid ~~(3)~~ which is lower than 1, in particular $m \leq 0.5$ and particularly preferred m=0.466 for a Reynolds number of the fluid ~~(3)~~ between 40 and 4000.

4. (CURRENTLY AMENDED) The method as claimed in ~~any one of the preceding~~ <u>any of</u> claims <u>1 and 2</u>, ~~characterised in that~~ <u>wherein</u> the build-up dynamics (P(t)) is selected to be proportional to a time-independent amplitude factor $(1+R_s/R_l)^{-1}$, wherein

R_s is a first thermal transfer resistance between the heating means ~~(la)~~ and a surface ~~(10)~~ of the sensor element ~~(1)~~ and $R_I=(h\cdot A)^{-1}$ is a second thermal transfer resistance between the surface ~~(10)~~ of the sensor element ~~(1)~~ and the fluid ~~(3)~~, wherein h is a flow-dependent heat transfer coefficient between the sensor element ~~(1)~~ and the fluid ~~(3)~~ and A is a contact surface between the sensor element ~~(1)~~ and the fluid ~~(3)~~.

5. (CURRENTLY AMENDED) The method as claimed in claims 3 ~~and 4, characterised in that~~ wherein a cylindrical sensor element ~~(1)~~, against which the fluid ~~(3)~~ is transversely flown, is selected with a heat transfer coefficient h proportional to v^m and with a second thermal transfer resistance $R_I=\gamma\cdot v^{-m}$, γ being a constant.

6. (CURRENTLY AMENDED) The method as claimed in claims 3 ~~and 4, characterised in that~~ wherein

a) in a first step discrete values of the flow rate (v_i) are selected and corresponding build-up dynamics $P_i(t)$ of the heating power are determined, wherein i=1, 2, 3, ... is an index,

b) in a second step a set of calibration curves ~~(8)~~ of the threshold value time (t_s) as a function of the flow rate (v) is determined for the build-up dynamics ($P_i(t)$) and

c) in a third step, on account of a previously measured flow rate or based on a-priori information about the presumed flow rate, a preferred calibration curve ~~(8)~~ is selected according to a desired measuring precision for the flow rate (v) and according to a desired measuring duration (t_s), and is used to determine the flow rate (v), or

d) in a third step, starting from the calibration curve ~~(8)~~ associated with the lowest flow rate value ($v_{i=1}$) and rising successively to higher flow rate values ($v_{i>1}$) or by estimating in a single step, a preferred calibration curve ~~(8)~~ is determined according to a desired measuring precision for the flow rate (v) and according to a desired measuring duration (t_s), and is used to determine the flow rate (v).

7. (CURRENTLY AMENDED) The method as claimed in claim 6, ~~characterised in that~~ wherein a number and distribution of the calibration curves ~~(8)~~ are selected according

to a desired measuring resolution and to a desired measuring range of the flow rate (v).

8. (CURRENTLY AMENDED) The method as claimed in claims 3 ~~and 4, characterised in that~~ wherein $R_s/R_I<1$, preferably $R_s/R_I<0.1$ and particularly preferred $R_s/R_I<0.01$, and a heating power factor P_0 are selected and the threshold value time (t_s) is calculated as an exact linear function of the flow rate (v) according to an equation

$$t_s(v)=(T_s - T_F)^{1/m} \bullet (P_0 \bullet \gamma)^{-1m} \bullet v,$$

wherein γ is a constant and T_F is an undisturbed fluid temperature.

9. (CURRENTLY AMENDED) A device for carrying out the method as claimed in claim 6 ~~any one of the preceding claims~~, comprising a sensor element ~~(1)~~ with a heating means ~~(1a)~~ and a sensor means ~~(1b)~~ for thermal measuring in a fluid ~~(3)~~ and a control and evaluating processor unit ~~(2)~~ with a heating control ~~(2a)~~ for generating heating pulses ~~(7)~~ for the heating means ~~(1a)~~ and a measuring device ~~(2b)~~ for evaluating the thermal measurement and for determining a flow rate (v) or a mass flow from a flow-dependent threshold value time (t) until a preset temperature threshold value (T_s) at the sensor means ~~(1b)~~ is reached, ~~characterised in that~~ wherein

a) the heating control ~~(2b)~~ comprises means for generating a non-constant heating power (P) with a substantially sublinear build-up dynamics (P(t)) as a function of the time (t), and

b) the control and evaluating processor unit ~~(2)~~ has means for at least partial compensation of a nonlinear behaviour of the threshold value time (t_s) as a function of the flow rate (v).

10. (CURRENTLY AMENDED) The device as claimed in claim 9, ~~characterised in that~~ wherein

a) the control and evaluating processor unit ~~(2)~~ comprises hardware and/or software for generating a build-up dynamics (P(t)) proportional to t^m and/or to

a time-independent amplitude factor $(l+R_s/R_I)^{-1}$, wherein t is a time variable, m is an exponent dependent on a Reynolds number of the fluid ~~(3)~~, R_s is a first thermal transfer resistance between the heating means ~~(lb)~~ and a surface ~~(la)~~ of the sensor element ~~(1)~~, $R_I=(h\bullet A)^{-1}$ is a second thermal transfer resistance between a surface ~~(10)~~ of the sensor element ~~(1)~~ and the fluid ~~(3)~~, h is a flow-dependent heat transfer coefficient between the sensor element ~~(1)~~ and the fluid ~~(3)~~ and A is a contact surface between the sensor element ~~(1)~~ and the fluid ~~(3)~~ is and/or

b) the control and evaluating processor unit ~~(2)~~ comprises calibration means ~~(2c)~~ for carrying out the first and second step ~~as claimed in Claim 6~~.

11. (CURRENTLY AMENDED) The device as claimed ~~in any one of claims 9 to 10, characterized in that~~claim 9, wherein:

a) the sensor element ~~(1)~~ has an electric heating wire ~~(la, lb)~~ with a temperature-dependent resistance, which can be operated simultaneously as heating means ~~(la)~~ and as sensor means ~~(lb)~~ and/or

b) the sensor element ~~(1)~~ has a heat capacity Cs and a first thermal transfer resistance R_s between the heating means ~~(lb)~~ and a surface ~~(10)~~ of the sensor element ~~(1)~~, wherein the threshold value time or measuring duration is $t_s>C_s\bullet R_s$, in particular $t_s>10\bullet C_s\bullet R_s$, and/or

c) the sensor element ~~(1)~~ has a cylindrical shape with a diameter (d) and which has, when the fluid ~~(3)~~ flows laterally against it with the flow rate (v), has by approximation a flow-dependent heat transfer coefficient $h=\lambda/d\bullet 1.11\bullet C\bullet Pr^{0.31}\bullet Re^m$, wherein λ is a heat conductivity of the fluid ~~(3)~~, C is a parameter and m is an exponent, which depend on a Reynolds number Re of the fluid ~~(3)~~, and Pr is a Prandtl number of the fluid ~~(3)~~.

12. (NEW) The method as claimed in claim 4, wherein a cylindrical sensor element, against which the fluid is transversely flown, is selected with a heat transfer coefficient h proportional to v^m and with a second thermal transfer resistance $R_l = \gamma \cdot v^{-m}$, γ being a constant.

13. (NEW) The method as claimed in claim 4, wherein

a) in a first step discrete values of the flow rate (v_i) are selected and corresponding build-up dynamics $P_i(t)$ of the heating power are determined, wherein i=1, 2, 3, ... is an index,

b) in a second step a set of calibration curves of the threshold value time (t_s) as a function of the flow rate (v) is determined for the build-up dynamics ($P_i(t)$) and

c) in a third step, on account of a previously measured flow rate or based on a-priori information about the presumed flow rate, a preferred calibration curve is selected according to a desired measuring precision for the flow rate (v) and according to a desired measuring duration (t_s), and is used to determine the flow rate (v), or

d) in a third step, starting from the calibration curve associated with the lowest flow rate value ($v_{i=1}$) and rising successively to higher flow rate values ($v_{i>1}$) or by estimating in a single step, a preferred calibration curve is determined according to a desired measuring precision for the flow rate (v) and according to a desired measuring duration (t_s), and is used to determine the flow rate (v).

14. (NEW) The method as claimed in claim 13, wherein a number and distribution of the calibration curves are selected according to a desired measuring resolution and to a desired measuring range of the flow rate (v).

15. (NEW) The method as claimed in claim 4, wherein $R_s/R_l<1$, preferably $R_s/R_l<0.1$ and particularly preferred $R_s/R_l<0.01$, and a heating power factor P_0 are selected and the threshold value time (t_s) is calculated as an exact linear function of the flow rate (v) according to an equation

$$t_s(v)=(T_s - T_F)^{1/m} \cdot (P_0 \cdot \gamma)^{-1m} \cdot v,$$

wherein γ is a constant and T_F is an undisturbed fluid temperature.